

Virtual Creature Fest: Whoo is Calling in the Dark?

Whoo is calling in the dark? Let's get to know the barred and the saw whet owl.

Barred Owl

"Who cooks for you, who cooks for you alllll?" From February through April, the strange courtship [song](#) of the barred owl (*Strix varia*) rings out in dense woodlands in more remote parts of the state. The barred owl is easy to identify by both sound and sight, if you can ever spot one. It is a large owl, about 20 inches tall, with a 40 inch wingspan. It's a very fluffy looking bird with rounded head that lacks the "ear" tufts of the other large owls like the great horned and long-eared owls. Brown and white mottled feathers and vertical streaking on the breast make it almost invisible against the bark of its daytime tree roosts.



Barred owls are non-migrants that rarely travel far from their dense forest habitats. They prefer unfragmented swamps and wet woods near streams, lakes, rivers, and wetlands. They are nocturnal hunters that perch and scan the forest for small mammals such as voles, mice, and shrews. These owls are opportunistic and will also catch birds, squirrels, chipmunks, reptiles, amphibians, and insects with their strong feet. They will sometimes perch over water and swoop down to catch fish or even wade out into shallows to catch a snake or frog! Barred owls often cache their prey in snag or branch and eat it later. When they do eat, they swallow small prey whole.

Barred owls are very vocal during courtship. In addition to their signature cooking questions, mating barred owls will perform outrageous [duets](#) of cackles, oo-oo-ah-ahs, and caws; ornithologists call this [caterwauling](#). From late winter to early spring, paired barred owls also strengthen bonds with elaborate displays. With wings outstretched, both the male and female bow to each, while tilting their heads from side to side, then follow it up with their monkey-laugh vocalizations. Barred owls are thought to mate for life and will occupy the same nesting territory and even use the same nest for many years.

Cavities in dead trees are the preferred nesting sites, although they will also use an abandoned hawk, crow, or reimagined squirrel nest. Sometime between March and mid-April, females lay one to five white eggs within the unlined nesting cavity. The male does the hunting and delivers food to the female while she incubates the eggs for about a month. The young remain in the nest for nearly another month, then leave the nest to begin branching. They can fly at about six weeks of age but do it sporadically till about ten weeks. The juveniles will continue to be fed by their parents on and off for the rest of the season.

Historically, the barred owl was a common resident in the dense, wooded swamps of the eastern U.S. After the Second World War, old growth forests were cut down and wetlands were filled to make way for development. Habitat loss has resulted in population declines for this reclusive bird. The barred owl was listed as a threatened species in New Jersey in 1979. They have been observed in the mature woodlands at Duke Farms, but do not nest here.

One of the only natural enemies of the barred owl is the great horned owl. Humans are the clear and present danger to this bird's survival. Barred owls require large expanses of mature wet forests and do not thrive in fragmented woodlands. Development, degradation, and



Barred owl chicks branching.

fragmentation of forested habitats have been and continue to be the primary threats facing barred owls. Their story gets really complicated when we take a look at how the owl has moved north and west throughout the last century. Fire suppression in Canadian forests and the Pacific Northwest allowed them to take up residence all the way into northern California. Once established they competed with the endangered spotted owl in those areas. Now with climate change and uncontrolled fires raging, we can only speculate on what will become of both owls in the not-too-distant future.

Northern Saw-Whet Owl

Only seven inches tall and weighing in at a mere 3 to 5 ounces, this little raptor is New Jersey's tiniest owl. About the size of a robin with way more feathers, the northern saw-whet (*Aegolius acadicus*) has a round head, big yellow eyes set against prominent facial discs, and no "ear" tufts. Saw-whet owls are residents of woodlands and like the other forest dwelling owls, their mottled brown and white feather patterns provide ample camouflage.

The name is curious, but how it came to be is not completely known. Somebody at some time in the distant past said the owl's [song](#) sounds a lot like a saw being sharpened on a whetting stone. Possible, but not everyone agrees with that analogy. In any case, it's repeated yelping "too-too-too" is a jarring sound when heard in the woods, in the dark, at night.



Despite their tiny size, saw-whets are fierce nocturnal hunters. They prefer deciduous and mixed hardwood forests with open understory near water. During the day, this little owl roosts in trees and makes itself invisible by staying close to the trunks of their roost trees. At night, they perch on low branches to hunt in the woods or venture out to surrounding open fields. Like the barred owl, their

favorite food is mice, especially deer mice and white-footed mice. They also favor voles, shrews and small mammals like juvenile squirrels, chipmunks, and moles. It is an opportunistic hunter like it's relatives and will eat small birds, amphibians, and every kind of insect depending on availability. Saw-whets tear their prey apart before they eat it, usually making two meals out of one mouse.



Immature saw-whet owl nestlings

Pair bonds depend a lot on food supply. In abundant years when there's lots of prey available, males may have more than one mate. Males start their territorial tooting as early as January. Saw-whets court and mate somewhere between late February and April. They use tree cavities as their nests and often seek out the abandoned nests of woodpeckers. The female is thought to choose the nest site and will line the bottom with moss, grass, or even old bird nests. The female will lay four to seven smooth white eggs in the cavity and incubate them for about a month. The chicks stay in the nest for about another month after hatching. Curiously, when the youngest nestling is about 18 days old, the female leaves the

nest to roost elsewhere. It's up to the male to continue hunting and feeding the chicks after she leaves. Sometimes the oldest nestlings will help feed the youngest ones.

Saw-whets will readily nest in human made nest boxes, but this only works if you have a densely wooded property within larger forested areas. You can learn how to make a saw-whet or other owl nest box [here](#).

Many northern saw-whets are year-round residents and stay close to where they were born. Others can be long distance migrants, moving south from Canada and the northern United States to more southern locations throughout the U.S. Migration of saw-whet owls only began to be understood in 1994 when researchers from the Maryland Department of Natural Resources set up an owl banding program to study owl migration. The program is called [Project OwlNet](#) and today consists of more than 100 migration banding and data collection sites across the U.S. and Canada. Scientists lure Saw-whet owls to mist nets by playing the owl's songs. The owls come to investigate the sounds and the researchers are able to collect data about the owls in real time.



A young barred owl checks out a backyard bird feeder. (photo courtesy of S. Evans, Manassas Virginia)

This study has shown that about once every four years, saw-whet owls irrupt. No, they don't explode; an irruption is when the owls head south in far greater numbers than usual. This can reflect an actual population increase or a change in migration patterns triggered by booms and busts of prey availability. When there's enough food, irruptive bird species stay put, finding what they need to survive hard winters. But when food is scarce, the birds spread east, west and south across the continent in search of better conditions. Saw-whets are predominantly a migratory species in New Jersey and have been observed at Duke Farms in the fall. They are not listed as Threatened or Endangered at this time. Researchers have only scratched the surface on how climate change effects the migration of the saw-whet owl.

More About Owls

In Old English, a sound like "oule" was used to identify these nocturnal birds. Sometime in the Middle Ages, the words hoole, howyell and owle, began to appear in written records. All of them attempted to name the night birds by their vocalizations. Not an easy task as owls have distinct [calls](#) that are unique to each species.

Most owls are night hunters and use their extraordinary vision and acute hearing to locate their prey. Owl [eyes](#) are tube shaped and so large there is little room for muscles inside their eye sockets. Though they can't move their eyes from side to side, they are able to rotate their heads 270 degrees to compensate. Their necks are so flexible it gives the illusion they can turn their heads all the way around in a complete circle. Their large eyes allow more light to enter the pupil to help them see in the dark. An owl's distance vision is so incredible that if it could read, it would be able to make out they type on a newspaper by the light of a candle from a mile away. However, they can't really see things up close very well and depend on hair like feathers on their beaks and feet to feel their food.

Owls have the best hearing of all birds, but the feather tufts that look like ears on top of some owls' heads have nothing to do with it. Their [ears](#) are actually located on the sides of their heads and hidden

by feathers. Owls have flattened facial disks that funnel sound to their ears so that they can detect even the slightest noise like a mouse stepping on a twig. The ear openings are placed so that one is higher than the other and have feathers that funnel sound into them too, like cupping hands behind your ears. This arrangement allows sound to reach each ear at a slightly different time and helps the owl pinpoint where the sound is coming from.



Owls have special adaptations like wide wings and fluffy feathers that allow them to fly silently. Soft comb serrations on the wing feathers and frayed edges on the tips of the tail feathers break the air flow and muffle sound. Like stealth bombers they swoop down to the ground and seize and sever the spines of rodents and small mammals with their powerful feet and talons.

Small prey like mice are swallowed whole while larger prey are shredded with their hooked beaks. Owls digest the soft body parts but cannot dissolve bones, fur, teeth, and claws. This waste matter is regurgitated in the form of densely packed small pellets. Owl [pellets](#) found at their roosting sites can be dissected to gain insight into owl diets.

There are eight owls that occur in New Jersey, some are year-round residents, and some are just winter visitors. The great horned owl and screech owl are common and doing well in our most densely populated state, but the short-eared owl, the long eared owl, barred owl, saw-whet owl, barn owl and snowy owl are endangered, threatened or rare in the state for a whole host of reasons. Habitat loss, forest fragmentation, pesticide use, land use change, and human disturbance have taken their toll on so many vulnerable wildlife populations, including our owls.

Climate change is a clear and present threat that scientists are only just beginning to fully understand. Wild swings in weather patterns, severe storms with extreme winds that blow down nest trees and cause both juvenile and adult mortality, extended periods of drought that dry up water sources, kill trees and depletes prey are just some examples of the unfolding climate crisis. Fires, floods, and famine are the harsh realities facing owls and all wildlife in the world today.

Although owls are protected by state and federal laws, their future status is uncertain. We can only hope that they will thrive and continue to enrich our lives.



Learn the Owls by Sound

Activity: Identify Owls by their calls

Every owl has unique vocalizations. Their songs and calls can be used to identify owls in the dark without seeing them! Here's a great activity to learn the owls by the sounds they make.

1. Download the free Cornell lab of Ornithology App called [Merlin](#) on your cell phone or tablet.
2. Look up the eight owls that occur in New Jersey on the App. Some are year round residents, and some are just winter visitors. The **great horned owl** and **screech owl** are common and doing well in our most densely populated state, but the **short-eared owl**, the **long-eared owl**, **barred owl**, **saw-whet owl**, **barn owl** and **snowy owl** are endangered, threatened or rare migrants in the state. *"Too-too-too calls the Northern saw-whet"*
3. View photos of each of the **eight owls** on the **Merlin App**, then view them one at a time.
4. Listen to the sounds each owl makes.
5. Repeat steps 3 and 4 many times
6. Eventually turn out the lights in a darkened room and have someone else play an owl call and song. See if you can remember the owl that is making the sound. Say its name out loud and have the person playing the sound show you the photo of the owl. Were you able to guess the correct identity?
7. Repeat this activity until you can guess all the NJ owls correctly.
8. Visit the Cornell Lab of Ornithology Bird Academy to review [owls](#) and their calls.

Activity: Listen for Owl Calls

No matter where you live, there can be owls living in your neighborhood. In the Eastern United States, the great horned and screech owl are the most common owls in rural, suburban, and even urban areas. It is possible to hear them calling in your area.

For this activity all you need is your ears. Go outside at dusk, after dark or just before dawn in fall or winter. Sometimes pre-dawn is best as there is little traffic and wind to block bird sounds. Sit or stand quietly and listen for natural sounds and the call of owls. Many times, great horned owls and screech owls communicate with mates and you can hear their duets if you are patient.

Look at the Cornell Lab of Ornithology's [Merlin](#) App or go the website [All About Birds](#) and search for owls. Listen to their calls and songs.

You may not hear them on your first foray outside at dusk or dawn, but if you keep trying you may have the joy of hearing them calling in the dark. Do this activity anywhere you happen to be during fall and winter months.

Additional Resources

- [All About Birds, Barred Owl](#)
- [All About Birds, Northern Saw-whet](#)
- [Spotted Owls competing with Barred Owls](#)
- [Conservation status of barred owl](#)
- [Owl Ears](#)
- [17 Owl Facts](#)
- [More Science activities about owls](#)

More Animal Sounds

If you are interested in animal calls, [this family fun video](#) shows photographs and provides related audio. Some are NJ native, while many are not found in our area. The presentation is about ten minutes long and you might be surprised by what you hear and what animal is responsible! You may be familiar with some from your own back yard or city green spaces. Can you recognize the sounds of the chipmunk, porcupine, skunk, racoon, bullfrog and more?

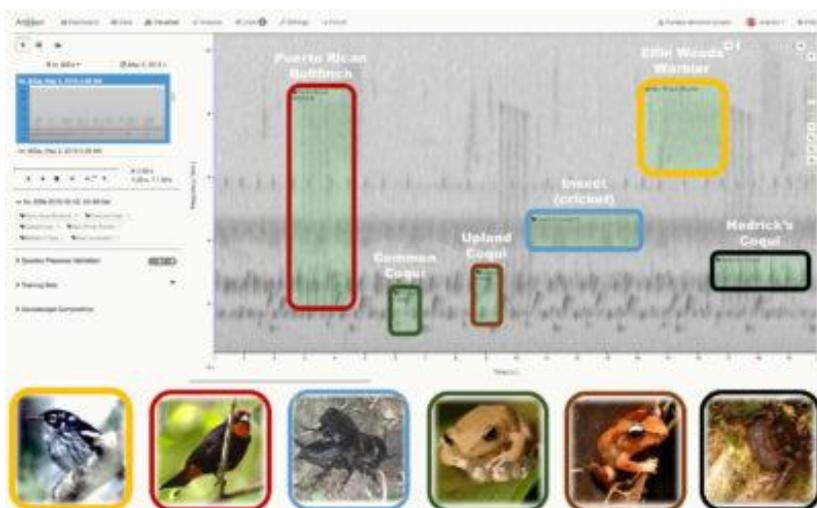
Listening to Nature: The Emerging Field of Bioacoustics

According to an article in *YaleEnvironment360*, researchers are placing microphones in forests and other ecosystems to monitor birds, insects, frogs and other animals. As the technology advances and becomes less costly, proponents argue, bioacoustics is poised to be an important remote sensing tool for conservation. Those using these devices state that audio recorders are better than cameras because they can record the calls and songs of many species over far larger areas. They do so efficiently and effectively so that scientists can then analyze the data.



(Photo Source -Alex Rogers)

Pictured is the AudioMoth recording device secured on a tree trunk on the U.K.'s New Forest National Park where it was searching for sounds of the cicada. The plastic bag keeps it safe from moisture.



This 20 second spectrogram identified 6 species of various audio frequencies when it was implemented in Puerto Rico.

Click [here](#) to access the YaleEnvironment360 review of this emerging technology.

Ideas for Implementation and Integration

There are several interdisciplinary strands and standards that are embedded within this saw-whet owl and barred owl article. Examples include:

- Acoustics, the branch of physics which encompasses the study of mechanical waves in liquids, gases and solids - sound
- Performing arts - vocalization and expression
- Technology and its application to researching nature
- Climate change and how spectrograms unveil and/or further substantiate its effect on fauna
- The adaptations of nocturnal predators and their food webs.

For more ideas, contact Kate Reilly, Manager of Education, Duke Farms at kreilly@dukefarms.org

All photos except where noted are courtesy of the Cornell Lab of Ornithology, Macaulay Library, Ithaca NY